When I obſerved the deepeſt ſenſible Red, and deepeſt ſenſible Violet, (the corrected diſtance of which Colours when all things were ordered to the beſt advantage, and the Sun ſhone very clear, was about $\frac{11}{12}$ or $\frac{15}{16}$ parts of the length of the rectilinear ſides of the coloured Spectrum,) I found the difference of the diſtances of their Foci from the Lens ſometimes $4\frac{3}{4}$ ſometimes $5\frac{1}{4}$, and for the moſt part 5 Inches or thereabouts: and as 11 to 12 or 15 to 26, ſo is five Inches to $5\frac{1}{2}$ or $5\frac{2}{3}$ Inches.

And by this progreſſion of Experiments I ſatisfied my ſelf, that had the light at the very Ends of the Spectrum been ſtrong enough to make the Species of the black Lines appear plainly on the Paper, the Focus of the deepeſt Violet would have been found nearer to the Lens, than the Focus of the deepeſt Red, by about $5\frac{1}{3}$ Inches at leaſt. And this is a further Evidence, that the Sines of Incidence and Refraction of the ſeveral ſorts of Rays, hold the ſame proportion to one another in the ſmalleſt Refractions which they do in the greateſt.

My progreſs in making this nice and troubleſome Experiment I have ſet down more at large, that they that ſhall try it after me may be aware of the Circumſpection requiſite to make it ſucceed well. And if they cannot make it ſucceed ſo well as I did, they may notwithſtanding collect by the Proportion of the diſtance of the Colours in the Spectrum, to the difference of the diſtances of their Foci from the Lens, what would be the ſucceſs in the more diſtant Colours by a better Trial. And yet if they uſe a broader Lens than I did, and fix it to a long ſtreight Staff by means of which it may be readily and truly directed to the Colour whoſe Focus is deſired, I queſtion not but the Experiment will ſucceed better with them than it did with me. For I directed the Axis as nearly as I could to the middle

middle of the Colours, and then the faint Ends of the Spectrum being remote from the Axis, caſt their Species leſs diſtinctly on the Paper than they would have done had the Axis been ſucceſſively directed to them.

Now by what has been ſaid its certain, that the Rays which differ in refrangibility do not converge to the ſame Focus, but if they flow from a lucid point, as far from the Lens on one ſide as their Foci are one the other, the Focus of the moſt refrangible Rays ſhall be nearer to the Lens than that of the leaſt refrangible, by above the fourteenth part of the whole diſtance: and if they flow from a lucid point, ſo very remote from the Lens that before their Incidence they may be accounted Parallel, the Focus of the moſt refrangible Rays ſhall be nearer to the Lens than the Focus of the leaſt refrangible, by about the 27th or 28th part of their whole diſtance from it. And the Diameter of the Circle in the middle ſpace between thoſe two Foci which they illuminate when they fall there on any Plane, perpendicular to the Axis (which Circle is the leaſt into which they can all be gathered) is about the 55th part of the Diameter of the aperture of the Glaſs. So that 'tis a wonder that Teleſcopes repreſent Objects ſo diſtinct as they do. But were all the Rays of Light equally refrangible, the Error ariſing only from the ſphericalneſs of the Figures of Glaſſes would be many hundred times leſs. For if the Object-Glaſs of a Teleſcope be Plano-convex, and the Plane ſide be turned towards the Object, and the Diameter of the Sphere whereof this Glaſs is a ſegment, be called D, and the Semidiameter of the aperture of the Glaſs be called S, and the Sine of Incidence out of Glaſs into Air, be to the Sine of Refraction as I to R: the Rays which come Parallel to the Axis of the Glaſs, ſhall in the Place where the Image of the Object is moſt diſtinctly made, be ſcattered all over a little Circle